

Printing Primer

Preface

The State Printing Center provides state government agencies with a full range of printing-from quick copying to full-color printing-as well as typesetting, creative, design and electronic prepress services. We offer the following information as part of State Printing Center's continuing effort to improve its quality of service. Part One contains basic advice on planning any printing job, whether done conventionally or with desktop publishing. Part Two has tips for desktop publishers. The information provided is not a general reference work on printing, nor does it address all-or even most-desktop publishing problems. It does, however, deal with many of the printing questions peculiar to state agencies, and we hope it will help our clients make the most of the resources available at State Printing Center.

Part One: Planning Your Job

Deadlines

The more time you give yourself and your printer, the better the final product. A ***RUSH!!!*** job is courting disaster. As a rough guide, producing a good quality, multiple page, multiple color publication takes several weeks after you approve the final proof.

In planning backward from your deadline, keep in mind that the term "printing" encompasses much more than the printing itself. Have you taken into account design and typesetting time, proofreading, sending proofs in the mail, getting approval from your supervisor, making color separations, shooting or imaging negatives, stripping the negatives into masking sheets, burning press plates, trimming the paper stock to desired press running size, cleaning the press, setting up the press with ink and plates, printing, folding, collating and binding, packaging and delivery? Consulting with State Printing Center staff will help you set realistic deadlines.

Creative and design services

State Printing Center's creative services on a project can range from none to all. For the desktop publisher who merely wants high resolution film or paper output, no creative services are required. State Printing Center also works with the client who is starting from scratch. In the latter case, a preliminary meeting will cover such issues as the effectiveness of previous materials, the audience, the action or reaction desired in the audience, the impression to be conveyed, the content, the budget, and a tentative production schedule with turnaround time. The next steps are research and copywriting, the development of the design concept, and the preparation of one or more roughs showing type and illustrations in position. Review and refinement of the roughs will result in the final design and layout. Most projects fall between these extremes, requiring some, but not all, of the steps outlined above.

Appropriate software

Valuable insight can be obtained from State Printing Center staff by checking out the publishing software you plan to use before you begin. We can discuss how it impacts our ability to complete your project. If you use software tools that are supported you stand a better chance of getting the desired results we will all be pleased with. Often our staff encounter word processing or slide presentation documents intended to be the final layout for a publication. Many hours of hard work have often gone into the preparation of these documents. In all honesty, we probably will have to reconstruct the publication from scratch. These types of software are not intended to be suitable substitutes for page layout.

Proof Approval

Only after you have approved the final proof does actual production begin. Checking the final proof not only involves proofreading text, but also verifying the accuracy of all visual elements. See the proofing checklist in Appendix A for guidance in checking a final proof.

Life

You can extend the life of a publication by keeping it as general as possible. For example, a letterhead listing every member of a commission is useful only as long as all the information on it is current. The more likely your information is to change, the shorter the advisable press run. Conversely, the less likely information is to change, the greater the economy of scale in a long press run.

Cost vs. quantity: a false economy

Most printing costs lie in the labor-intensive design, prepress, and setup operations. Once a piece is actually on press, the cost of each additional copy is minimal. Therefore, the effective way to hold costs down is with economical design, not by limiting the quantity.

Ink and color

Spot color

Spot colors are single color inks. They are used to achieve an exact color match or to add impact to a publication. State Printing Center uses the Pantone® Matching System for specifying spot colors.

You can avoid the expense of a press wash-up that is necessary when you switch colors by using the same colors throughout your piece. For example, if you use black and red on the front of a newsletter, use them on the back also. Switching to any other color combination on the back would add the cost of cleaning the press in between passes. Likewise, if you want a color on one page, you may as well have that color on every other page, because you have already incurred the press cleanup charge.

Process color

Process color printing uses four basic inks: cyan, magenta, yellow and black. Images are created by overlapping dots (rotating screens) of these four colors. The colors are recombined optically in the eye of the viewer. Process color printing is also called full-color printing because it can reproduce the complete color spectrum.

Tints

A tint is a screened spot color. The percentage of the screen determines the lightness or darkness of the tint. Tints are an economical way to create the impression of multiple colors from one ink.

Black

Printers consider black a color. Black is the most common choice for one-color jobs and for text in multiple color jobs. It is often cheaper to print in black because it need not be mixed and the printer may already have it on the press.

Paper

Coating

Uncoated paper is basic paper. The porous surface allows ink to be absorbed into the paper fibers. Coated paper has a thin layer of clay which provides a smoother surface and keeps ink from direct contact with paper fibers. The coating also reflects more light from the ink, giving a brighter color.

Color

White paper provides better legibility than colored papers and better reproduction of colors. Red paper of any shade and dark colors in general decrease legibility.

Because shades of colored paper can vary greatly from batch to batch, it may be advisable to place a special order for a very large job in order to be sure that the paper all comes from the same batch. Likewise, color continuity is necessary throughout consecutive runs, it is recommended to order a sufficient supply from one batch.

Special orders

State Printing Center stocks a variety of paper and can order virtually any stock. Swatch or sample books are available which show the great variety of paper on the market. Some stocks, especially cover stocks, require minimum orders of one carton. Special orders can add 3 - 10 working days to printing time.

Preparing text

State Printing Center can work from text submitted as hard copy or on diskette. Text on diskette can be imported into desktop publishing applications, thus saving the time and cost of retyping.

Changes and proofreading

Text should be thoroughly edited, approved and final. Editorial changes after typesetting or layout can be costly and time-consuming. Someone other than the author should proofread the final version because the more often one sees the *same text*, the less likely one is to notice mistakes.

Consistency

A style guide such as *The Associated Press Stylebook* and *Libel Manual* can help achieve consistency in capitalization, punctuation, abbreviation, and word usage. Avoid disparate usage such as "percent," "per cent," and "%," in the same publication.

Do not depend solely on your software's spelling checker. Spelling checkers do not correct properly spelled but misused words, such as "you" for "your."

Electronic text

The text must be plain text only, with no extraneous control characters. The control characters of word processing programs may affect text imported into page layout programs, and can require considerable time and effort to remove. Therefore, let your text flow with as few interruptions as possible. It is better to provide a sample or sketch of the layout on a separate piece of paper than to try to layout the page in word processing.

DO NOT

- use hard returns at line ends
- double or triple space
- use bold, italic, or underlined type
- use ALL CAPS
- try to arrange text in final layout on the page

DO

- use hard returns only at the ends of paragraphs
- include hard copy of your text

Preparing illustrations

Choosing illustrations

Illustrations should advance the purpose of a publication. The outline of the state defines a geographic boundary on a map. It is not art, and unless your publication deals with cartography or exploration the outline of Missouri is probably irrelevant. Instead, try an image that represents a function, theme, or purpose; or choose an abstract graphic that conveys the spirit you want to communicate. If a graphic symbol of Missouri is a necessity, the state seal and flag are good choices. Instead of the cliché "grip and grin" photograph of people shaking hands or exchanging an award, show them putting the award on display. Instead of the "firing squad" group photo, show people working together or grouped around some unexpected object.

Line art

If you are supplying line art, furnish clean originals with sharp, high contrast images. The originals should be as large as possible. Do not write on the back or fasten anything, such as tape, to the back because it will show through to the front under the bright lights of the darkroom camera. Do not mark on the image area.

Photographs and halftones

Photographs should be in focus and have a full range of tone or color. Slides or prints—either black and white or color—may be used. An original photograph consists of solid shades of gray or color that blend smoothly. This is called continuous tone art. In order to simulate continuous tone art on a press, the image must be broken into dots of various sizes and colors, called a halftone screen. This is traditionally done in the printer's darkroom, but can now be done with desktop publishing.

As with line art, do not write on the back or fasten anything to the back because it will show through in the darkroom or on the final scan. Do not mark on the image area. Indicate crop marks on the borders of the photograph. Do not fasten photographs with glue, tape, or paper clips.

Photo CD

If your publication includes photographs or if you plan to use one photograph frequently, putting photographs on compact disc is more economical than having conventional color separations made. State Printing Center can make separations from the Photo CD directly to film.

Digital images

If you own a digital camera and decide to include your own creations in a publication, remember to properly access what it takes to produce a quality image for reproduction. The cheaper cameras are often used to capture images for web development, but can lack the resolution of sufficient quality to be used in print media. State Printing Center staff can help you determine what is best for publication work.

Submitting "camera-ready" jobs

Getting a publication to the camera-ready stage is not always easy. If any work remains to be done before making the negatives for the press plates, then the job is not camera-ready.

Imposition

The pages of a publication must be arranged for imposition so that they are in the proper sequence when bound. In order to be "camera-ready" your publication must be laid out for imposition. For example, in an eight page publication, pages one and eight must be printed on the same side of the same sheet of paper, and so on with pages two and seven, three and six, and four and five. If you are joining single facing pages from a desktop laser printer for imposition, tape them together with white (not clear) tape. If dummy sheets are used for paste-up, make sure the copy is placed consistently from page to page.

Page numbers required

In all publications of more than one page *all pages must be numbered!*

Halftones and art

Windows for halftones must be solid and the reduction or enlargement percentages of line art or halftones must be indicated.

Part Two: Desktop publishing

State Printing Center serves as a prepress service bureau for many state agencies, running their desktop files to film on a high-resolution imagesetter. Experience has taught us many tricks of the trade that can help your publications look better and your desktop files run faster and with a minimum of rework or extra time charges. But first a word of caution.

Desktop publishing requires the client to assume many burdens which were formerly the artist's, typesetter's, or printer's. Just because a piece looks good on the computer screen does not mean that it can be played out from a high-resolution imagesetter or put on press. If terms such as trap, proportional letter spacing, and outline fonts are not familiar, additional reading of desktop publishing documentation may be in order.

Typography

Your personal computer does much more than a typewriter. The computer keyboard and desktop publishing software together bring you five centuries of typographic knowledge that far exceed the lowly typewriter's abilities. Following are some simple ways to improve your typography.

Spacing between sentences.

Double spacing between sentences is a habit most of us acquired from the typewriter, on which all characters are monospaced. Each letter occupies the same amount of space. For example, the "i" takes the same amount of space as the letter "m." With monospacing, two spaces separate sentences visually. Real type, however, spaces letters proportionally, so the "i" occupies about one-fifth the space of the "m."

With proportional spacing, whether two spaces are necessary after periods is a matter of taste. Single spacing between sentences is a convention that developed in the middle of the twentieth century. Earlier, the double space between sentences was common, even in typographically excellent books. The important thing is to know that you have a choice.

Word and letter spacing

Because we read by recognizing the outline shape of a word rather than by looking at individual letters, each word should be distinct from its neighbors. Most desktop publishing's letter spacing is too loose and most word spacing is too tight. The result is that a desktop publishing page tends to be grayish overall and harder to read than a page of conventionally set type.

Unfortunately, the factors of word and letter spacing are so idiosyncratic that general guidelines for adjusting type spacing are almost impossible. The particular desktop publishing software, the font, the font vendor, the printer and its software, the computer operating system, and the computer hardware can all change the appearance of type.

The following are merely suggested points of departure for improving the type spacing defaults of Quark® XPress and Adobe® PageMaker:

Word spacing: minimum 75%, optimum 100%, maximum 125%

Letter spacing: minimum -2%, optimum -1%, maximum 2%

To change the typographic preferences, launch the application but do not open a document. In PageMaker, the dialog boxes are under "Spacing," which is under "Paragraph" in the "Type" menu. In Quark® XPress they are under "H&Js" in the "Edit" menu.

Hyphenation

Desktop publishing hyphenation can be unreliable. If you are using automatic hyphenation, double check for badly hyphenated words.

Real quotation marks, apostrophes, and dashes

" and ' are inch and foot marks. - is strictly a hyphen. Typists use them because there are no true typographic symbols on typewriters.

Real typographic symbols are available on the Macintosh or PC keyboards. The en dash is used to show a sudden change of thought-and does not have a space on either side of it. You can find the keystroke combinations to the following symbols in your software's documentation: en dash, em dash, opening double quote ("), closing double quote("), opening single quote, and closing single quote and apostrophe.

Compare the legibility of the following examples.

Typewritten

"A house divided against itself cannot stand." I believe this government cannot endure permanently half slave and half free. I do not expect the Union to be dissolved -- I do not expect the house to fall -- but I do expect it will cease to be divided. It will become all one thing or all the other. Either the opponents of slavery will arrest the further spread of it, and place it where the public mind shall rest in the belief that it is in the course of ultimate extinction; or its advocates will push it forward till it shall become alike lawful in all the states, old as well as new -- North as well as South.

Abraham Lincoln, June 16, 1858

Without desktop publishing defaults

"A house divided against itself cannot stand." I believe this government cannot endure permanently half slave and half free. I do not expect the Union to be dissolved -- I do not expect the house to fall -- but I do expect it will cease to be divided. It will become all one thing or all the other. Either the opponents of slavery will arrest the further spread of it, and place it where the public mind shall rest in the belief that it is in the course of ultimate extinction; or its advocates will push it forward till it shall become alike lawful in all the states, old as well as new -- North as well as South.

Abraham Lincoln, June 16, 1858

With typographer' marks and words and letter spacing adjusted

"A house divided against itself cannot stand." I believe this government cannot endure permanently half slave and half free. I do not expect the Union to be dissolved -- I do not expect the house to fall -- but I do expect it will cease to be divided. It will become all one thing or all the other. Either the opponents of slavery will arrest the further spread of it, and place it where the public mind shall rest in the belief that it is in the course of ultimate extinction; or its advocates will push it forward till it shall become alike lawful in all the states, old as well as new -- North as well as South.

Abraham Lincoln, June 16, 1858

Importing graphics

Scale and rotate graphics before importing

Scaling and rotating graphics after they have been imported slows processing speed when imagesetting. Whether or not this poses a problem depends on the size and complexity of both the imported graphic and the publication itself. Generally, large, complex graphics should be sized and rotated in the original applications, before they are imported.

One graphic per EPS file

Cropping an imported graphic within the publication can cause problems too, especially if there are several graphics in one EPS (Encapsulated PostScript) file. Never combine several graphics into one file if you plan to use them individually. Each time you place the EPS file, the image processor must process the entire file even though only a small part shows through the cropped window.

Color separations

In order to print different colors on one sheet of paper, printers separate the page into its component colors. Traditionally, color separations were made in the darkroom by photographing the objects for each color on a separate negative. Desktop publishers can now make separations on their computers.

Define colors consistently

All objects and text that are the same color must be defined exactly the same. For example, suppose we create a flier in a page layout program. Our text is black. Our headline is PANTONE 123 CVC. Now, let us create a graphic in an illustration program and assign it the color PANTONE 123 CV. We import it into the page layout document and print separations. OOPS! We get one plate for black, one for PANTONE 123 CV, and another for PANTONE CVC. (The second "C" stands for "coated.") Any change in the name-even from upper to lower case or the deletion of a space-creates another color separation. PANTONE 123 CV, Pantone 123 CV, and PANTONE 123CV are three different colors as far as our computers are concerned. Likewise, Black and Process Black are different.

Make test separations on your desktop printer

Run test separations from your desktop printer. If the document will not print correctly in your office, State Printing Center will not be able to print it either. If you get too many or too few plates, or items print on the wrong color separation plate, fix the problem before it becomes urgent and expensive.

Beware your color printer

A color desktop printer can be wonderfully helpful for previewing a publication, but a color composite does not indicate whether separations can be made. The only way to tell for sure is to make test separations.

Trap

When two colors touch, trap is needed. If you cannot create trap, do not let colors touch. It is that simple. Here is why.

When colors touch, a white space-or knockout-must be left of the second ink to print into. The only exception is that black text usually can overprint a colored background. In all other instances, a very small amount of overlapping-called trap-is needed because printing presses do not align the paper perfectly every time it passes through the press. The amount of trap needed depends on the job and the press. At State Printing Center one-half point of trap is usually sufficient.

Some desktop illustration applications can create trap. Of the popular page layout programs, Quark® XPress handles text trapping the best. Adobe® PageMaker has trapping for objects and text.

Text trapping should be reserved for type of sufficient size such as headlines or titles. Body text is often too small to trap and is best suited to be overprinted. When you see type that is set to spread across a white background and colored background, you will notice a difference in the type against the colored background appearing to be bolder. This is the result typical software trapping gives.

When constructing your illustrations, think about how best to build the trap into the art. There are commercial software programs available to take care of trapping concerns but are rather costly and often reserved for high-end imaging systems. State Printing Center prefers the graphic designer build in trap when creating illustrations.

Assembling desktop files for output at State Printing Center

The State Printing Center supports many desktop publishing applications for the Macintosh personal computer and can translate some of the PC versions of applications as well. Most desktop publications consist of three kinds of files: graphics, the publication itself, and fonts. It is essential to send all files used for your publication.

Include original graphics

You must include the original, separate, electronic file of any art or graphic you have placed (imported) into your page layout or illustration software. When an object is imported, only enough data is stored in the publication to show a rough representation-called a screen place holder-on the computer monitor.

A document with a screen place holder but without the original graphic can often be printed on a desktop printer. However, high resolution imagesetters require the original graphic file. If the original is not present, a PostScript error occurs and the document cannot be printed. Before you hand the publication off, make sure you have included the original file and have linked the screen place holder to the original graphic. If you have the habit of placing art into new art documents rather than copying and pasting the art, be especially careful to send the original.

Some page layout programs do offer the option of storing the complete graphic within the publication, but this is to be discouraged for two reasons. First, every internally stored graphic increases the publication's size. Second, if there is a minor error in the original graphic, State Printing Center may be able to correct it if you have included the original.

With Quark® XPress and Adobe® PageMaker, all imported files should be put on the same level (i.e., in the same folder) as the publication so that the application can automatically link the screen place holder to the original.

Quark® XPress has a subprogram called "Collect for Output" and Adobe® PageMaker has a utility plug-in feature called "Save for Service Provider..." that can collect all necessary files and prepare a document to be sent to the prepress service bureau.

Do not use page layout programs merely to ship graphic files

In light of the preceding section, it is obvious that a page layout program is not a suitable vehicle for shipping graphics. For example, suppose you want color separations of your agency's logo for silk screen printing. You create a page layout document, import the logo, save the file on diskette and hand it off to State Printing Center's Printing Services Representative for separation work. All the State Printing Center receives is a document with a screen place holder. So, forget about the page layout software, just send the original graphic by itself!

Clear the pasteboard

The Raster Image Processor (RIP) must process any text or graphic remaining on the pasteboard (the area beyond the margins of a page) even though they will not appear on the printed page. Clear the pasteboard of unwanted text and graphics to make your file smaller and faster running.

Include font information

Provide State Printing Center with source and name of fonts included in your publication. Commercial typefaces are licensed per laser printer, sometimes per individual user. It is not a good practice to loan fonts to service bureaus hoping they will use them and destroy them after your publication is printed. Should you require a special font-not found in our font library-in your publication, make arrangements with your Printing Services Representative to purchase the font ahead of time to avoid delaying the printing of your publication.

Reduce Adobe® PageMaker file size with "Save As..." command

Adobe® PageMaker has the peculiar feature of storing all data from previous versions of a publication every time you use the "Save" command. The consequent accumulation of data can consume an excessive amount of disk space. The "Save As..." command compresses the file by saving only the current data.

Send hard-copy backup copy

For clarity's sake, always provide a sample hard copy, also known as a dummy. This dummy will usually be in the form of a black and white composite from your desktop printer. If the piece will be printed in color, use a colored pencil or marker to indicate color breaks on the dummy. Printing a dummy from your desktop printer provides a good final test of your document's construction. Be advised that if you cannot print your document in your office, we will not be able to print it either.

For safety's sake, always keep an electronic backup of your final publication and images.

Appendix A: Proofing Checklist

Address number, street name, city, state, and zip code are correct.
Area code and telephone numbers are correct.
Postal information (permit numbers, symbols, return address) is correct.
If included, the item code or number, printing dates, quantities, copyright, and origin are correct.
Names, titles, and affiliations are correct.
Product names and trademarks are correct.
Event dates, locations, and room numbers are right.
Copyright and legal information are complete and accurate.
Photographs are correctly cropped and are enlarged or reduced the specified amount.
Photographs are on the proper page and in the proper position, and are identified correctly.
Captions are under appropriate photographs.
Text will not be affected by necessary printing, gripper, punching, and binding machinery.
Sizes are as specified, including all dimensions, right and left margins, centering, and alignment.
Color breaks conform to specifications.
Revisions have been made as specified.
Markup for the printer includes keylines or color breaks, pagination dummy, screen percentages, and lines per inch.

Appendix B: Desktop prepress checklist

All original graphics are included.
Screen place holders are linked to original graphics.
There is only one graphic per imported EPS file.
font listing included per commercial vendor.
Color definitions are consistent among all files.
Trap has been created where colors touch.
Sample separations have printed correctly.
Old versions of files have been removed from disk and trash can has been emptied.
A final desktop dummy is included.
The dummy shows color breaks (and folding, if necessary).
The backup copy is safely stored.

Appendix C: Software supported

Adobe® Illustrator
Adobe® InDesign
Adobe® PageMaker
Adobe® Photoshop
Corel® Draw
Macromedia® Freehand
Microsoft® Publisher 2002
Quark® XPress

Appendix D: Electronic media supported

3.5" double density diskettes, 720k or 800k (one hole)
3.5" high density diskettes, 1.44 Mb (two hole)
3.5" 120 Mb super drive diskettes
5.25" 44 Mb SyQuest cartridges
5.25" 88 Mb SyQuest cartridges
3.5" 100 Mb Iomega ZIP cartridges
3.5" 128 or 230 Mb Magneto Optical cartridges
CD-ROM, CD-R, or CD-RW discs